



Annex to Solar Keymark Certificate		Licence Number		011-7S 2182F										
Supplementary Information		Issued		2022-03-10										
<b>Gross Thermal Yield in kWh/collector at mean fluid temperature <math>\vartheta_m</math></b>														
	Standard Locations	Athens			Davos			Stockholm			Würzburg			
Collector name	$\vartheta_m$	25°C	50°C	75°C	25°C	50°C	75°C	25°C	50°C	75°C	25°C	50°C	75°C	
Junkers FCC-2S		2 310	1 584	974	1 710	1 126	653	1 270	789	443	1 389	857	473	
Gross Thermal Yield per m <sup>2</sup> gross area		1 105	758	466	818	539	313	608	377	212	664	410	226	
Annual efficiency, $\eta_a$		63%	43%	26%	50%	33%	19%	52%	32%	18%	53%	33%	18%	
Fixed or tracking collector		Fixed (slope = latitude - 15°; rounded to nearest 5°)												
Annual irradiation on collector plane		1765 kWh/m <sup>2</sup>			1630 kWh/m <sup>2</sup>			1166 kWh/m <sup>2</sup>			1244 kWh/m <sup>2</sup>			
Mean annual ambient air temperature		18.5°C			3.2°C			7.5°C			9.0°C			
Collector orientation or tracking mode		South, 25°			South, 30°			South, 45°			South, 35°			
The collector is operated at constant temperature $\vartheta_m$ (mean of in- and outlet temperatures). The calculation of the annual collector performance is performed with the official Solar Keymark spreadsheet tool Scenocalc Ver. 6.2 (13.01.2022). A detailed description of the calculations is available at <a href="http://www.estif.org/solarkeymarknew/">http://www.estif.org/solarkeymarknew/</a>														
<b>Additional Information</b>														
Collector heat transfer medium		Water-Glycole												
The collector is deemed to be suitable for roof integration		No												
The collector was tested successfully under the following conditions:														
Climate class (A+, A, B or C)												A+	--	
G (W/m <sup>2</sup> ) >		1100			$\vartheta_a$ (°C) >	40			$H_x$ (MJ/m <sup>2</sup> ) >	700				
Maximum tested positive load												4000	Pa	
Maximum tested negative load												3000	Pa	
Hail resistance using ice balls (diameter)												35	mm	
<b>Additional collector attribute(s)</b>														
Using external power source(s) for normal operation		No											Active or passive measure(s) for self-protection	No
Co-generating thermal and electrical power		No											Façade collector(s)	No
<b>Energy Labelling Information</b>						<b>Additional Informative Technical Data</b>								
	Reference Area, $A_{sol}$ (m <sup>2</sup> )	<b>Hydraulic Designation Code</b>						Aperture Area, $A_a$ (m <sup>2</sup> )						
Junkers FCC-2S	2.09	8-VH-1234S-A:5.2,1866-C:16.6,1070						1.95						
<b>Data required for CDR (EU) No 811/2013 - Reference Area <math>A_{sol}</math></b>						<b>Data required for CDR (EU) No 812/2013 - Reference Area <math>A_{sol}</math></b>								
Collector efficiency ( $\eta_{col}$ )	52%					Zero-loss efficiency ( $\eta_0$ )	0.68			--				
Remark: Collector efficiency ( $\eta_{col}$ ) is defined in CDR (EU) No 811/2013 as collector efficiency of the solar collector at a temperature difference between the solar collector and the surrounding air of 40 K and a global solar irradiance of 1000 W/m <sup>2</sup> , expressed in % and rounded to the nearest integer. Deviating from the regulation $\eta_{col}$ is based on reference area ( $A_{sol}$ ) which is aperture area for values according to EN 12975-2 or gross area for ISO 9806:2017.						First-order coefficient ( $a_1$ )	3.64			W/(m <sup>2</sup> K)				
						Second-order coefficient ( $a_2$ )	0.012			W/(m <sup>2</sup> K <sup>2</sup> )				
						Incidence angle modifier IAM (50°)	0.94			--				
						Remark: The data given in this section are related to collector reference area ( $A_{sol}$ ) which is aperture area for values according to EN 12975-2 or gross area for ISO 9806. Consistent data sets for either aperture or gross area can be used in calculations like in the regulation 811 and 812 and simulation programs.								
DIN CERTCO • Alboinstraße 56 • 12103 Berlin, Germany														
Tel: +49 30 7562-1131 • Fax: +49 30 7562-1141 • E-Mail: <a href="mailto:info@dincertco.de">info@dincertco.de</a> • <a href="http://www.dincertco.de">www.dincertco.de</a>														